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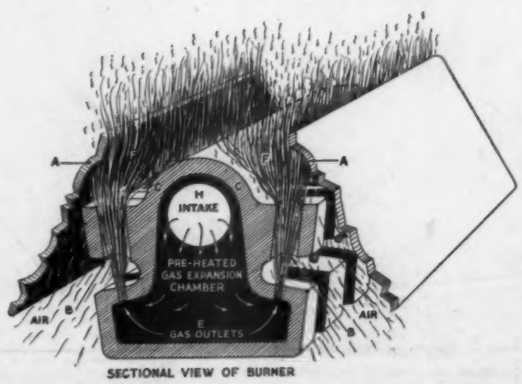

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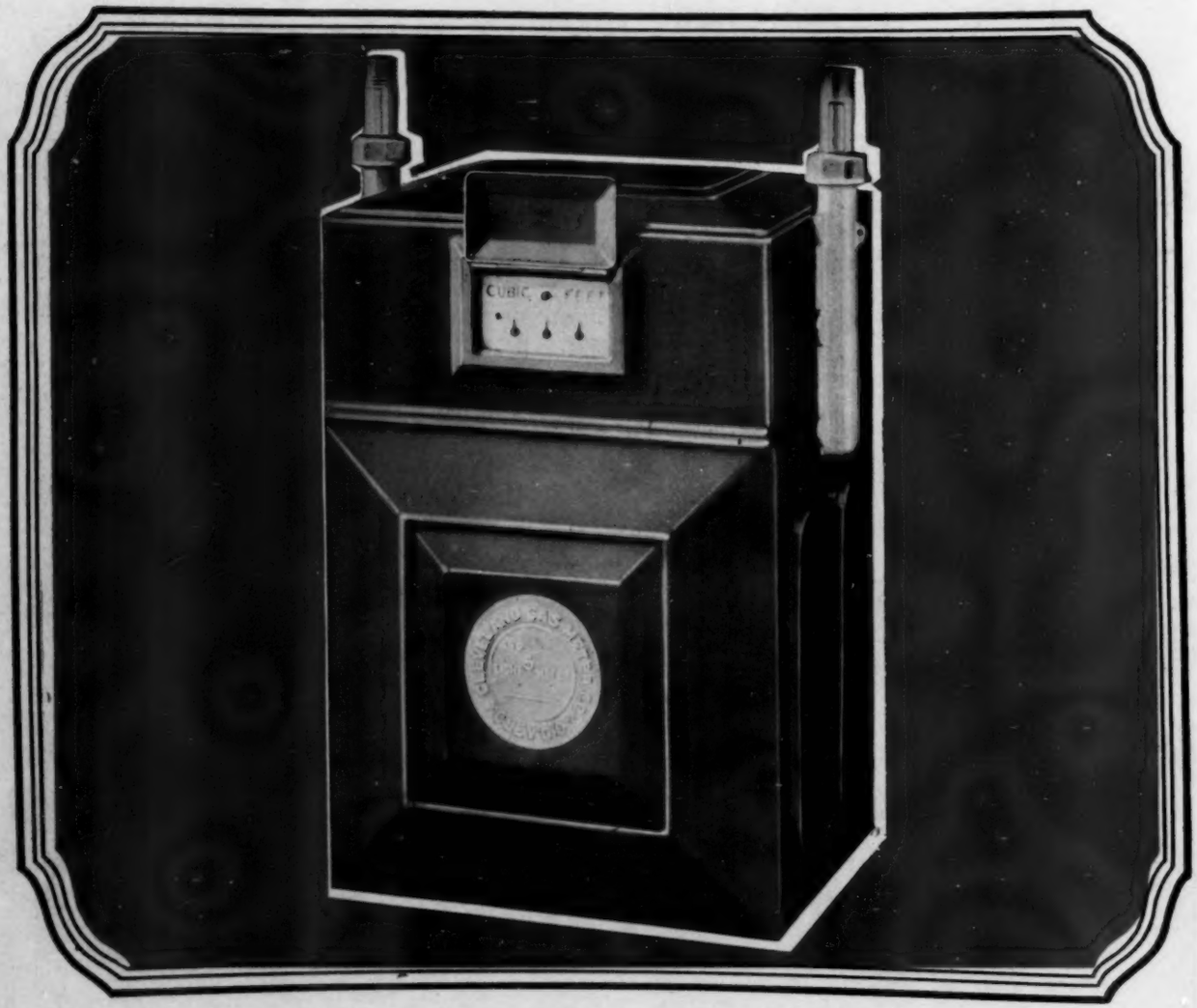

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Fuel of the Future--What Shall It Be?

XXV. Heat treatment of metals—Calculations continued

Ismar Ginsberg

This article is to be the last in the Series which will be concerned with the heat treatment of metals. In previous articles there have been discussed the technical details of the heat treating operations, the character of the fuels that are employed in these processes and the qualities that these fuels must possess in order to be given any consideration at all for use in this field, the effect of the design of the furnace on the results of heat treatment and many other details that are peculiar to this important industry. There have also been given a number of examples of calculations so that the industrial gas engineer might be able to see how the consumption of gas for a heat treating operation is determined. In some cases it has been impossible to carry out all the calculations on a strictly mathematical basis, making use of certain definite well-established and entirely substantiated physical laws. It has been necessary to insert what might have appeared to be arbitrary factors, which have, nevertheless, been developed from actual practical observation of the operation of the furnace.

These articles have been prepared, not with the idea of solving in advance any heat treating problem, but merely to give the gas man some useful information on the use of gas in this industry. It is not possible to lay down any absolutely strict rules of procedure which will apply to all cases and which the gas man can employ in handling any industrial problem, as, for example, any problem in the heat treating field. This cannot be done, and even if it could be done, it is doubtful whether it would be advisable to do so. Each and every industrial gas man must rely to a great extent on his own ingenuity and on his own resourcefulness in solving industrial gas problems. He has, of course, the help of his associates, of the manufacturers of industrial gas equipment, who are ever ready to assist him in solving his problems, but he must be able to develop his prospect to a certain point without outside interference. For he must inculcate in the mind of his prospect a feeling that the gas company and the gas man know what they are talking about, know, if you please, somewhat more about the thermal details of the use of gas for the particular industrial purpose in question than the manufacturer himself. He must be able to engender a feeling of confidence in his prospect, and this at times is a difficult task. For it must be remembered that the industrial gas man, who is undertaking to supplant another fuel by gas in a manufacturing establishment, is going to create a certain amount of confusion in the plant, is going to disrupt to a certain degree the smooth course of the manufacturing process. It stands to reason that the most progressive manufacturer will be very conservative in studying any proposition that has this feature as one of its inherent characteristics. It is absolutely necessary to convince him that the undertaking is worth while before he will consent to it.

Education of the Industrial Gas Men

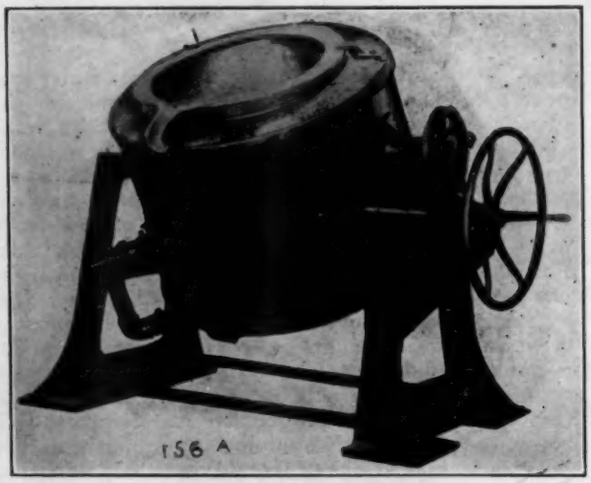
All that has been said in this article and in the others of this series from its very start has been with a single purpose in mind. Our sole endeavor has been to assist in a small way in rendering available valuable information to the gas engineer engaged in industrial work. Today there is scarcely any more important problem in the gas industry than the education and training of the industrial gas engineer and salesman. It is a problem with which various gas companies have been concerning themselves and it is safe to state that its solution has not yet been absolutely clearly defined.

The difficulty in the education of the industrial gas man has been that he must be not only an engineer but a salesman as well. He must understand very thoroughly the physical and chemical characteristics of his problem; he must, in other words, be very well

versed in physics and chemistry and in the practice of engineering. He must understand the details of the industrial operation, whether it is the annealing of steel or the manufacture of varnish, the singeing of calico or the baking of bread. And in addition to everything else he must be a salesman. He must possess selling ability. For he is selling gas, and no matter how advantageous his fuel may be, how much benefit it will yield the manufacturer, he cannot succeed in selling his prospect, in convincing him of these facts, unless he understands something of the art and psychology of salesmanship.

The Salesman or the Engineer

This, then, brings up the question which has still remained unanswered to to the satisfaction of all. Is it easier, preferable and more advantageous in the long run to try to make an industrial gas salesman out of the engineer or out of the salesman? Many different views are held on this subject and all are based on facts which are well worth considering.



Aluminum Melting Furnace

It appears to us to be a question as to how the industrial gas business will develop in the future. Will the gas companies continue to build up comprehensive industrial gas departments, comprising experts of one sort or another, or will it be content to leave the question of technical details to some specially organized enterprise which will specialize in this work? The question is simply, Who will do the technical work, where will the technical information lie that can be called upon in case the occasion arises?

The Problem of Education

It has often been held by students of this problem that it is more difficult to train the engineer to become a salesman than it is to train the salesman to become the engineer. This may or may not be true, and it all depends on the definition of the terms involved. A good salesman is often considered a natural salesman, that is, one who has inherent selling ability. The same characteristics apply to a good engineer, a good surgeon, or lawyer, etc. Some of us appear to have natural aptitude for certain work. But such people are essentially in the minority. In the major number of cases the human mind is so constituted that it can be trained to acquire a certain degree of aptness for certain work.

Thus it is possible to train the average engineer to be a salesman of some ability, and it is also possible to train some salesmen to acquire enough engineering knowledge to make efficient industrial gas salesmen. But the question arises, which is the more important qualification of the gas man, selling ability or engineering knowledge? To our mind, the answer is that the industrial gas engineer must be more of an engineer than a salesman.

The reason is simply that the thermal details involved in the average industrial gas job are considerable, and the sale is eventually made on the thermal saving effected by the use of gas, or the operating advantages gained thereby. All this presupposes a sound engineering training and knowledge on the part of the industrial man. The sale is made, not because the industrial gas engineer possesses great shrewdness as a salesman, but that because of his superior knowledge of thermal matter he has been able to evolve a proposition in which gas is the fuel and which is surrounded with many advantages for the ultimate user of that fuel. The sale is made on the merits of gas, and if it were done otherwise, the sale would not stand. It would not be long before gas would be supplanted by another more advantageous fuel.

Selling Ability Necessary

But in spite of the importance of the technical information possessed by the industrial sales engineer, it is essential that the engineer know how to approach his prospect, how to interest him, how far to go in each interview, how to develop any initial spark of interest displayed until it bursts into a flame of enthusiasm and not only is a sale made but a friend is also gained. This connotes training the engineer. It is true that the average engineer is not a salesman, but he does not have to be a salesman in every sense of the word, a thorough student of selling psychology, as is found in the commercial end of the gas industry. He must simply be trained to acquire a certain amount of fundamental selling knowledge and must be allowed to secure actual selling experience, which may be even more important than the training itself. This can be done without great difficulty.

Of course, there are some engineers who will never succeed in becoming sales engineers. This is perfectly true, but such individuals should not be encouraged to enter this field. All of us possess a certain inherent selling ability, for that is all we do all our lives, sell our service or the products that we make or obtain from others. It would then appear a much more advisable procedure to develop this inherent selling ability in the engineer to the extent that is required in an industrial sales engineer than to try to make an engineer out of the sales-

(Continued on page 228)

Bituminous Coal as a Generator Fuel*

Results of a five-day practical test are given

H. S. Parker
Muskegon, Mich.

THERE has been much said during the past year in gas journals and at conventions relative to the merits of bituminous coal versus coke as generator fuel for water gas machines. Little has been said, however, on the actual operations with respect to difficulties that confront the superintendent and operator during the period from the time coal has replaced coke until satisfactory results are obtained. As a matter of fact, no two plants (from observation) operate with the same cycle or under the same operating conditions, and yet each individual plant is well satisfied with results obtained from coal. Therefore, the object of this paper is not to attempt the standardization of operation when using bituminous coal as generator fuel, but more as a guide from which an operator or superintendent could convert from the standard water gas operation using coke to the use of bituminous coal without much difficulty.

Selection of Coal

The selection of coal depends largely upon the results obtained from coal operation. By this I mean the coal should be very low in ash with a fusing point of about 2900° F. The coal should be as hard as possible in order to eliminate dead fire in center of generator, and low in sulphur content. Coals that do not disintegrate or spall off when subject to high heat in water gas generator are more desirable and meet the ideal requirements for water gas fuel.

To begin with, water gas machine must be equipped with dust catchers and clean-out doors in carburetor and superheater so that blown-over fuel can be removed when necessary. Two connections directly above the guides in the hot valve can be made through which drip oil may be inserted at intervals as a solvent for carbon deposits which form in the hot valve from the use of bituminous coal. In some cases the checker brick in both carburetor and superheater have been relaid with straight flues having 4" spacing which allows the blown-over fuel to drop directly into the ash pan below the grates. However, this is still a question, as good results are obtained with the use of staggered brick as well as the straight flue.

Cycle of Operation

The cycle of operation varies largely in different plants, principally on account of different sized machines, but practice in general would warrant the following explanation:

Having the machine up to heat, a short air purge is allowed before steam is admitted to the machine and a somewhat larger purge after the run, saves the rich gases given off the bituminous coal for the first three or four runs after charging. This air purge reduces oil per M. but must not be carried to excess. Too much purge reduces generator fuel per M. and increases the oil. By constantly increasing the length of blow-runs we increase a percentage of producer gas, which requires the admission of more oil to maintain a given B.t.u. standard.

We, therefore, cannot hope to reduce the fuel per thousand below a point whereby the increased oil cost would far exceed a saving in bituminous coal.

Comparative Thermal Costs

On a comparative B.t.u. basis of materials themselves, one pound generator fuel (bituminous coal) has a heating value of approximately 14,000 B.t.u.'s while one gallon of gas oil 34 degree baume has a heating value of approximately 175,000 B.t.u.'s. On a cost basis 5 pounds of generator fuel is the equivalent of 1/5 gallon of oil (coal costing $6 per ton and oil $0.075 per gallon) the 5 pounds of fuel being a 70,000 B.t.u. against 35,000 B.t.u. of gas oil. We, therefore, see that on a B.t.u. basis of materials one dollar will buy double the amount of B.t.u. in generator fuel as it will in gas oil.

For example, supposing generator fuel (bituminous coal) costs $6 per ton, which is equivalent to 3/10 of a cent per pound, and, supposing further, that gas oil costs 7 5/10 cents per gallon. This would mean that 5 pounds generator fuel costing 1 5/10 cents would be equivalent in cost to 1/5 gallon of oil. We are inclined to believe that in the operation of a water gas machine it would require considerably more than 1/5 of a gallon of oil to offset a saving of 5 pounds of generator fuel.

Blow-Run Should Not Be Carried to Extreme

Considering the cost as explained in the above paragraph, the blow-run should not be carried to extreme or beyond a point that is detrimental to oil results. In order to reduce our oil per thousand as a matter of saving it would seem that we would be justified in increasing our generator fuel per thousand in order to save oil per thousand cubic feet of gas. This, however, could be carried to extreme in either case and we feel that each company would be able to determine for itself wherein the blow-run does not injure oil results.

Assuming, for example, 35 pounds generator fuel was used and we increase this amount to 40 pounds per thousand, we would increase our cost 1 5/10 cents per thousand for generator fuel. On the other hand, considering the B.t.u. value of both coal and oil, we

*Paper prepared for Thirty-third Annual Meeting, Michigan Gas Association, June 25, 26, 27, 1925, Mackinac Island.

would be obliged to increase our oil 2/10 per thousand if we decrease our generator fuel 5 pounds per thousand. On a cost basis the increase in oil over that of coal would be 1 5/10 cents greater for B.t.u. received.

Again we find that the point of economical operation reverts back to the individual company who have their own problems to work out.

Operating Details

Getting back to operation, much can be said regarding height of fuel bed with reference to blown-over fuel. Too high a fuel bed increases the amount of blown-over fuel and yet decreases the percentage of blow holes in the generator. Blast pressure and steam both play an important part in condition of fuel bed. Too much blast or steam seems to increase blow holes, while an insufficient amount forms a dead fire in the center which is detrimental to good operation. Some companies carry a very high temperature in the top of the generator for the purpose of eliminating blow holes and burning some of the free carbon that passes into the hot valves.

Bituminous coal practically eliminates any clinker trouble and preserves the life of generator linings. There will form, however, over a period of several weeks a thin deep clinker on the side wall that will necessitate several hours to remove. Generator coal being a coking coal forms a dead fire over the grates at the end of several hours' run which should be removed unless blast pressure is available. Under such conditions it is possible to operate machine over a period of 48 to 50 hours without cleaning fires. Instead of finding considerable ash and clinkers when cleaning fires, as is customary with coke operation, the dead fire in the bottom of generator is composed of small coke and small percent of clinkers. Very little ash is apparent. In most cases false bars are required when cleaning fires as the dead fire is loose and can be removed with a hoe or similar tool. When grate bars are clean false bars are removed and fuel bed will slide down the side walls of the generator. Reclaiming fuel machinery is not necessary under bituminous coal operation as all waste generator fuel and fines from dust catcher makes excellent boiler fuel, having about 20% ash.

Avoidance of Excess Smoke

Before cleaning fire after machine has been idle for a few hours, it is advisable to bring machine up to heat and make two to three runs so that when machine is newly charged the carburetor can be lighted easily, thus avoiding excess smoke. This, however, can be controlled without much difficulty. One indication of a cold machine will be noticed by the formation of tar around the charging opening of the generator. An increased amount of tar will be noticeable from coal operation which may cause trouble if an overflow of water is circulated back through the machine before the warm tar has had a chance to settle out. Circulating water having too large a per cent of tar absorbs the gas oil and decreases the B.t.u. value. In some plants it has been necessary to increase the size of the settling tanks or reservoirs beyond the tar separator in order to pump water free from tar back through the machine. Water gas tar produced by bituminous coal contains a large per cent of carbon, making an emulsion that is difficult to separate in a centrifugal tar separator.

The capacity of a water gas set is cut about 8% by the use of bituminous coal when the blow run is not used beyond the point which will increase oil per M. cubic feet. From the standpoint of operation, operators favor coal in preference to coke on account of clinker formation and ideal heat control. Operators are able to maintain a more even heat control with coal than with coke.

Results of Tests

In conclusion I have listed five days' tests on five different kinds of bituminous coal that were considered good generator fuel. With the exception of coal No. 4 the costs are about the same, but there is a noticeable difference in the amount of gas made per hour between Nos. 1 and 2 and Nos. 3, 4 and 5.

Comparative Tests on Five Different Bituminous Coals Used as Generator Fuel

Coal	Gross Fuel per M.	Net Coke Recovered	Net. Gen. Fuel	Gas Made M. C. F.	Total Hrs. Run	Make per Run C. F.	Make per Hr. C. F.
1.	39.03 lbs.	10748 lbs.	34.70 lbs.	2483000	53.75	4187	46195
2.	36.68 lbs.	12815 lbs.	31.68 lbs.	2582000	55.75	4134	46310
3.	36.47 lbs.	13113 lbs.	32.65 lbs.	3413000	74.30	3792	43573
4.	41.32 lbs.	11475 lbs.	35.8 lbs.	2076000	52.45	3464	38733
5.	37. lbs.	9885 lbs.	33.5 lbs.	2525000	60.04	3770	42277

Make per Sq. Ft. Grate Area per M.	B.t.u. Avg.	Oil per M.	B.t.u. per Gal.	Cost Oil & Fuel per M.	Cost Coal 2x4 Egg	Frt. Rate	Cost Oil
1393	535	2.62	107700	.24.881	2.00	3.28	.06
1400	543	2.66	109350	.24.876	2.50	3.28	.06
1838	534.8	2.95	94002	.24.4	1.75	3.28	.06
1676	544.8	3.13	95638	.28.08	2.15	3.28	.06
1792	534.	2.63	108441	.24.45	1.90	3.28	.06

Meter Reading and Bill Delivering*

A report on various methods by sub-committee of pacific coast accounting section

C. R. Johnson
Portland Gas & Coke Company

TO a certain degree, the work in conjunction with the reading of meters and delivering of bills has been considered by the majority of utilities throughout the country as a somewhat unimportant function. However, during the past few years, they have begun to realize that this point of contact with the public should be considered a very important phase of the companies' operations, in addition to reducing costs and increasing efficiency through the installation of modern methods.

As there are many different meter reading methods in use at the present time, it would be impractical to submit one system in theory, because it would become necessary to make radical changes in other departments of the utility before such theoretical system could be adopted.

This report, therefore, cites two or more methods by which the work can be handled. In order to make a thorough, analytical study of this subject, it was decided to divide it into eight component parts, as follows:

1. Type of men to be employed.
2. Should uniforms for meter readers and bill deliverers be adopted?
3. Remuneration or salary basis.
4. Handling of meter readings.
5. Delivery of bills.
6. Should estimated bills be rendered?
7. Is a bi-monthly billing system desirable?
8. Public relations.

Type of Men

Men who are to be employed for the work of reading meters should be the average type of individual from twenty-five to thirty years of age, of neat appearance, aggressive, and courteous at all times. It has been demonstrated that married men are more reliable and better suited for this kind of work than single men.

Too often a meter reader may possess a grouchy disposition and be ready to snap at the customer with a short answer, should they ask for information. It should always be remembered that "the company will be judged by the employees it has."

Delivery of Bills to Customer

There are two general methods pursued by utilities on the Coast in the delivering of bills to customers. The first method is where the bill deliverers or collectors attempt collection at the time the bills are presented to the customers. The other one is where bills are delivered and payments are not accepted at the time of delivery, but are made at the company's offices, branches or pay stations.

It has been found that married men of higher type and those of more mature age shouldering the responsibilities of life are the most acceptable to act as collectors. They should be neat and presentable in appearance, having a pleasant approach and be very diplomatic. If, in addition, the collector possesses the element of thrift, he is more apt to live within his means and maybe save a portion of his salary, whatever it may be. A collector inoculated with the "thrift" germ is the least liable to fall for the temptations that they are sometimes submitted to, i. e., to borrow from their collections when pay day seems a few days too far away.

Where collection is not attempted at the time bills are delivered, it has been found by experience that young men from eighteen to twenty-one years of age, of the high school type, are the best suited for this work and can be employed at a reasonable salary. It should be remembered that boys of this age are naturally not as responsible as older men, and care should be taken to employ only clean, trustworthy and straight-forward young men.

Uniforms for Meter Readers and Bill Deliverers

The consensus of opinion of the members of this committee is that while the practice of uniforming meter readers and bill deliverers (not collectors) is not in effect in their own companies, yet they believe it is a good policy.

One of the utilities (Portland Gas & Coke Company) reported that in August, 1924, a rule was established that all meter readers and bill deliverers wear uniforms, leather puttees and caps. The uniforms were of forest green whipcord.

Some companies have it understood when a man is employed that he is to furnish his own uniforms and keep them in proper condition at all times.

One method, however, which has worked out satisfactorily is for the company to allow the employee $5 per month in addition to his salary to keep himself properly uniformed, the types of uniforms being specified by the company.

Since the adoption of these uniforms no difficulty has been experienced in securing addmittance to customers' premises, as was occasionally true in the past. The company has received many complimentary remarks from custoemrs regarding the snappy, business-like appearance that the employees now present.

Remuneration or Salary Basis

Most companies pay employees engaged in this class of work straight monthly salary. However, one company reports a premium system which has been

*Read at 1925 Convention of the Pacific Coast Gas Association.

in effect since March, 1920, and that greater efficiency has been achieved. Collection at the time of bill delivery is not attempted. The method pursued in handling the premium system is as follows:

It serves as an incentive to meter readers and bill deliverers to secure more readings and deliver more bills per day, whereby they are offered ample opportunity to increase their earnings, if they desire to put forth the extra effort. The standards are based upon the previous performances on the various routes properly checked. For example, the average standard is 200 meter readings per day on which a premium of one cent is paid for each meter read over the standard. In districts that are sparsely or thickly settled the premium, of course, varies in amount. If a meter reader reads less than the standard in a given day, the number of meters read under the standard counts as a deduction from the premium earned to date. For each meter skipped (not read) over and above the number allowed, a penalty of two cents is deducted from the premium earned, and for all meters read incorrectly a penalty of three cents is made, and on rereads or skipped readings a penalty of four cents is deducted.

The bill delivering standard is determined by taking into consideration the different meter reading routes which are involved in the day's work. A delivery consists of one or more bills delivered to one address, place or mailbox; in other words, if there are two or more bills for one address (including bills for apartment houses) it is considered as one delivery.

Handling of Meter Readings

There are two prominent methods at the present time by which meter readings are recorded. One is by the use of the meter reading books and the other is by the tape method.

The meter reading book consists of loose leaf sheets, one sheet for each meter. Such sheets show the customer's name, address, meter number and other miscellaneous information and space is provided for one or more years' readings.

While most of the utilities throughout the country employ the book system, yet there are a few objections to its use. For example, with the book system it is necessary to enter all changes of customers' accounts, such as meter locks, meter turn-ons, new meter sets, changes and removals, as well as making the same changes on the addressograph equipment, which is maintained for the purpose of printing the bills each month. Also, it is possible under the book system for meter readers to "fake" readings, and especially is this liable to happen where the company serves suburban territory which in many instances may be sparsely settled.

The Tape System

When the tape system is used all meter orders, after being entered on the customers' ledgers, are applied to the addressograph plates. These plates show the meter number and size, name, address and mailing address, if any. Gas bills are printed from these plates and after the bills have been printed for each route the "tape," which consists of double-width adding machine rolls, is printed and, of course, shows the same information as the bills. By the use of the tape system the expense of maintaining meter reading books is eliminated.

The addressograph plates are filed in the same geographical street order that the ledgers are in.

Delivering of Bills

Among the public utilities various methods of bill delivery are followed. Some companies prefer to mail all bills; others make personal presentations and collections and still others make personal delivery without the effort to collect.

To conform to the choice of the gas user all three methods might be employed, but hardly a single city or district could be found in which every customer would be satisfied with any one method. It seems obvious, therefore, that the utility is obliged to adopt the method that will meet with the approval of the largest number of customers. It is practically admitted that whether collection is attempted at the time of bill presentation or not, the best method of bill delivery is by the companies' own employees, except, of course, in far and outlying districts. One company reports that all bills with the exception of those for outlying territory are delivered, and that a considerable saving is effected by such procedure. Another advantage derived by a company delivering its own bills is that by such performance they are under the company's control from the time the meters are read to the delivery on customers' premises.

There are a few companies, especially in the smaller cities, that use either the postal card system of bill or mail the bills direct to the customers as, on account of the small number of customers, it would not be advisable to deliver their bills. There are, however, a number of companies that use what is known as "combination" men who read meters, deliver bills, handle locks and turn-ons and orders of a like nature.

Bi-Monthly Billing

While the bi-monthly billing method has been adopted by some utilities throughout the country in connection with the handling of residential accounts,

(Continued on page 231)

A Show Window Advertising an Attractive Range Proposition

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

PROSPECTS FROM PLEASED CUSTOMERS

THE pleased customer is one of the best recommendations a salesman can have when calling on a prospect. How many times have you heard a salesman say: "We just sold one of these automatic Heaters to Mr. Bighouse," or "Mrs. Hightop uses a gas range just like this one." Then you know the effect and while you would not imitate anyone else for the world, the chances are you purchased your automobile, radio, or heating system for the sole reason that Charlie Smith told you all

about his at the Exchange Club. Charlie is a satisfied customer and he advertises the merchandise he is satisfied with and assists in selling others. If you know who your satisfied customers are, cultivate them, ask them whom they have told about their new house heating system, gas range or water heater. Jot down names and addresses! Here are live prospects! Make it one of the duties of some employee of the merchandising department to find out who the pleased customers are and whom they have told that they were pleased and you'll have some mighty fine prospects to work on.

MERCHANDISING IDEAS

PRACTICALLY all gas men find it difficult to keep up with the large number of profitable ideas and sales plans which appear in the publications that come to their desks. Therefore a considerable proportion of business-getting ideas are overlooked. One busy commercial manager has solved this problem in a way that is highly profitable to his whole organization, in that he is assured of new ideas as they are published and has an ample stock of usable ideas on file for all seasons. This man has delegated several employees in his department to read certain publications as soon as they come to the office and to "blue pencil" everything that appears to hold a good idea on sales work, store and window display, advertising and special sales plans. These items and illustrations (in case of window displays) are then clipped and filed alphabetically in what he terms his "Idea File."

THE CAUSE OF HIGH LABOR TURNOVER

THERE is a lot of complaint these days about the high turnover of labor. "Heavens!" exclaimed one sales manager, "we just can't keep our districts full. We are always looking for men and getting them, too, but they will not stay. And the men we do keep don't seem to put it over. We are always having to take back stuff and make adjustments—it's a terrible life!"

This man blames it all upon his men, while a little investigation shows that about 80 per cent of the fault may be traced directly to the door of his own office. True, he hires and fires men and men quit—his rate of man turnover is high with a big H. Distribution suffers here—the customer has to pay in excessive overhead cost. The sole reason is that the men do not know their merchandise and no one has the time to tell them about it. When asked about that phase of the work this man said: "Why, we haven't time to train all the people we employ, and you can see what it would mean in waste from those figures you just saw showing the number of men who have been in our employ during the past two years. If we started in to train these men we'd justa bout get them broken in, when they would leave and go somewhere else." We did not press the point, yet we could not help but wonder if this man, who employed men and after letting them wander around the company's store for two or three days, would employ a plumber who had three days of such training. Or if he would put a man out as a fitter, who had been around the shop three weeks. As we see it, training courses are an asset to any organization instead of a liability, an investment instead of an expense.

A Budget Plan for the Salesman

Planning one's work to attain a set goal brings results

Frank H. Williams

"YES, I run up pretty high sales every year and I show a good gain every year over the previous year, on the average," said a live wire house-to-house salesman for the appliance department of a gas company who has been out hustling this sort of business for a long time.

"The way I do it," this salesman continued, "is quite simple. I work on a definite budget showing me the things that I am to accomplish all the time.

"My budget consists of these three things:

"More calls per day.

"An honest, fair-and-square day's work every day.

"A certain definite amount of sales every month.

"But, I should say before explaining the various features of this budget, that the number of calls I can make every day is limited because I have found that it pays me to spend a certain definite amount of time on each call.

Don't Rush Calls

"When I first started in this business of selling gas appliances by house-to-house solicitation my first idea was to get through each call just as quickly as possible, because by doing so I would have the opportunity for making a greater number of calls every day. But as I got farther into the game I found that this wasn't a good plan, because I didn't give myself time enough at each call to make a really good impression on the prospect. Consequently, I lost out on numerous sales which I should have made. Now I make myself spend at least thirty minutes at each call and I want to tell you that this gets a lot better results in putting sales across than my former plan of simply rushing through each call just as quickly as possible.

"It would seem, though, at first glance as though this thing of devoting at least a half hour to each call would automatically make it impossible for me to make more than a certain definite number of calls each day. So it would appear as though my budget calling for more presentations every day couldn't be carried out.

"But I am carrying it out by devoting more time to my business and by systematizing my solicitation so that there is less time spent in tearing around the city long distances to visit prospects at certain appointed times. More system in following up prospects and more time devoted to work each day enable me to make more calls per day, even though I do devote at least thirty minutes to each call.

"So much, then, for the first part of my budget.

An Honest Day's Work

"And now about the second feature of the budget—this feature calling for a fair and square, honest day's work every day.

"Before I planned this budget system I was under the impression that I was putting in a good, honest day's work every day on the job. But when I came to actually look at the proposition and analyze the things I was doing I was astonished to find that I was spending quite a large part of each day in wasted effort and lost motion and plain loafing.

"For instance, I found that there was no system at all to the way in which I followed up prospects who were interested in the appliances I was selling and who asked me to come back again at specified dates. I'd race clear across the city to call on one such prospect and I'd chase clear back across the city to call on another one without making any effort at all toward saving the time spent in going to and from calls.

"Again, I found that I was spending a lot more time than was really necessary in cigar stores where I was kidding myself into thinking that I was getting worth-while and highly valuable information regarding the people I was going to call on.

"Also I found that I was knocking off early and making excuses to myself for not working and all that sort of thing. I wasn't putting in an honest, fair and square day's work on the job at all. And as soon as I began to do so I commenced getting better results than ever before.

Sales per Month

"And now about the third feature of my budget—the apportioning out of certain sums to be sold in certain definite periods.

"I keep records of the sales I make from month to month and from year to year. I add up the sales for the months so that I have the records for the quarters and the half years and the years.

"Also I keep records regarding the sales I make of various kinds of appliances. For instance, I have the quarterly and half year and year records of the sales I make on heaters, the sales I make on ranges and so on and so forth.

"Of course, it has taken some effort to keep all my sales classified and recorded in this way, but an adding machine and the determination to do the recording and summarizing right at the proper time have cut down the work so that the job hasn't been anywhere near as much as you might think.

How It Is Done

"So, then, when I start in a new quarter of a year I go over my records and find out what my sales have been as a whole in the corresponding quarters

(Continued on page 224)

As The Journal Views It

THE COMPANY AND THE EMPLOYEE

In any business, the relations between the company and the employees must be of such a character that both are convinced that the other is acting with due consideration of their interests. There must, in other words, be mutual understanding between the two. The company must feel that its employees are thoroughly loyal to it, and have its interests at heart. On the other hand, the employee must realize that he owes a certain loyalty to his company and at the same time, he must feel as well that the company has his interests at heart, and is doing the best that it can for him. When such mutual understanding exists, the business enterprise is bound to succeed and progress, and there is no possibility of any friction between those two important factors which make up any business organization.

In the gas industry, this relationship is in most cases a very happy one. Most companies understand that they owe a certain responsibility to their employees. They do the most that they possibly can for the members of their organization. They exert all efforts to training them for higher positions in the company, and there are examples of gas companies who go even further than that, and manifest a certain amount of interest in the personal affairs of their employees, when they are called upon in case of trouble. It is true, that in carrying out such activities, the company must avoid all semblance of paternalism, but judicious and tactful efforts are possible and productive of good results.

That both the gas employees and the gas company should understand each other is a very important matter. For, it has often been said that the gas industry is a peculiar industry, in that it has a large list of customers, all of whom must be kept satisfied. The gas industry, as well as the other public utilities, must have the good-will of its customers, but if it has not the good-will of its own employees, to start with, there is no question at all but that it cannot secure that of the community which it serves. For, the contact between the gas company and its customers is made by employees of the gas company, and generally by those who hold comparatively subordinate positions in the organization. It stands to reason that if these employees, who come into contact with the customers, have grievances, either just or unjust, against the company, the impression left upon the gas consumer will invariably be a bad one.

Thus, as it has been said, the company must sell itself to its employees. It must see to it that the employees are thoroughly interested in their work, and if they are not, it must take steps to make them interested, or else arrange that the chronicly disgruntled members of its organization are made to resign. It must have intelligent, loyal and enthusiastic employees. This connotes that these employees are also well treated, for the well treated man makes the most efficient workman. The gas company must realize that it is to its entire advantage to have such a group of men and women in its organization. There is no question but that when such is the case, the work will be done better. Customers will be treated more courteously, and will be better satisfied, complaints of all characters, disputes over bills, etc., will be reduced, and, finally, more gas and more gas appliances will be sold.

How to sell itself to its employees, is a problem that each individual gas company must answer for itself, as conditions vary considerably from one gas organization to another. However, whatever method is used, the fundamental feature of it must be to make the employee understand the attitude of the company towards him. The company must make the employee understand that it is watching his efforts, and that these efforts, when they deserve it, will be adequately rewarded. The company must make its employees appreciate the advantages that are offered in the gas field. It must also lend every effort to attracting the right personnel to its organization.

When it exerts itself in this direction, good results are bound to be forthcoming. The employees will be satisfied and so will be the customers. The company will then possess a well-developed organization working in harmony, each member of which is thoroughly imbued with the proper spirit of cooperation and loyalty. Such an organization, of course, depends upon the existence of proper leadership, and in the gas industry, we are very fortunate indeed in having leaders who are thoroughly awakened to the needs of the industry and to the fact that any business organization is not stronger than the men who constitute it.

A BUDGET PLAN FOR THE GAS SALESMAN

(Continued from page 222)

of other years. Then I set up a quota for my sales in the coming quarter which will be ahead of what I have done in previous quarters but which will still be a reasonable figure which I feel I can reach without undue straining and effort.

"Then I set down the figures showing just how much my sales have been in the various appliances in the same quarter of previous years and also figures showing just what sales I should make in all the different appliances in order to reach the total sales for the quarter that I have chosen as the budget for the quarter.

"All this, then, gives me a definite mark to shoot at for the quarter and, as I do the same thing for the half year and the full year, it always gives me a definite and specific mark to shoot at all the time and so puts my selling efforts on the firmest sort of a foundation and gives me enthusiasm and zest for my work.

"In other words, I know definitely all the time just how I'm going and just how I'm going to get there. And I'm convinced that if other gas appliance salesmen who are making house-to-house calls in soliciting business would adopt a budget system like mine, they would find it the biggest sort of an aid to them in getting more business and in making more money.

The Value of the System

"Also, it strikes me that the whole appliance department of the gas company could operate on this budget plan with equal success.

"Of course, all appliance departments know what their total sales for previous years have been, but do they know just what the sales have been of the individual appliances handled by their departments which have contributed to the total sales?

"It strikes me that if the appliance departments would analyze their total annual sales and see just what appliances have contributed the most to the grand total and just which appliances have not sold so heavily, they would be in better shape to step out and get more business in the coming year. Of course, some enterprising appliance departments make such analyses and profit accordingly, and if more of them would do this, the better it would be for business generally.

"And it also strikes me that if appliance departments, as a whole, would set budgets telling how many presentations they intended to make in certain definite periods, it would prove to be a help to them in making more sales and in getting more money."

Aren't there some worth-while suggestions in all this which will be of real value to other appliance salesmen and to appliance departments as a whole?

Gas is Best—
for Cooking
If It's Done with Heat You Can Do It Better with Gas
Housewives who once try gas for cooking never would be without it for they find these advantages in its use—
A gas fire builds itself instantly.
Gas is clean—there is no kindling or coal to carry in and there are no ashes to carry out.
Gas is inexpensive and safe—it burns only when you need it.
For quick, clean heat—gas is best.
ILLINOIS GAS SERVICE
Illinois
Power and Light
Corporation

A Direct Appeal to the Housewife

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 87

Heat and Change of State

SUPPOSE the gas engineer was asked to calculate the amount of heat that was required to raise the temperature of a salt solution (common salt or sodium chloride) to the boiling point, when the initial temperature was 60 degrees F The concentration of the solution is 25 per cent. Of course, if the case was concerned with pure water it would only be necessary to multiply the number of pounds of the solution, which may be taken as 1000 pounds for the purpose of this problem, by the difference between the initial and the final temperature, so as to obtain the number of B.t.u. required. But in this case we are concerned with a solution of salt in water and the boiling point of this solution is higher than 212 degrees F., and, furthermore, the specific heat of the solution is not unity but something else. Hence the calculation is not as simple as it appears.

In the first place, what is the specific heat of a solution of salt water of twenty-five per cent concentration? The specific heat of a salt solution will, of course, vary in accordance with the percentage of salt that is contained in it. Thus, when the percentage of salt is five, the specific heat is 0.9306, when it is ten per cent the specific heat is 0.8909, when it is fifteen per cent the specific heat is 0.8606, when it is twenty per cent the specific heat is 0.8490 and when it is twenty-five per cent the specific heat is finally 0.8073.

The boiling point of a solution of salt containing twenty-five pounds of the salt to 75 pounds of water or 33 pounds in 100 pounds of water is in the neighborhood of 103 degrees C. or 221 degrees F. All the values are now known for making the calculation.

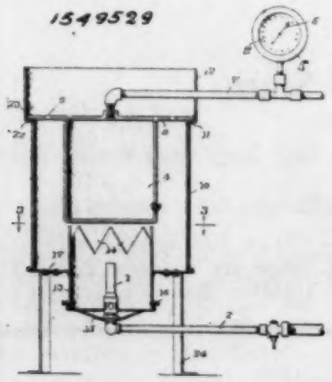
Thus, 1000 x (221 — 60) x 0.8073 = 1000 x 161 x 0.8073 = 130,000 B.t.u. This is the heat required. If, on the other hand, it was desired to raise an equivalent amount of water the required temperature range, then there would have been required 1000 x 1.0 x (212 — 60) or 1000 x 152, or 152,000 B.t.u. In other words, there are required 22,100 B.t.u. less to heat the salt solution than to heat pure water. Even though the boiling point of the solution is higher, nevertheless, the specific heat is so much less than that of water that the total heat required is lower.

HEAT CONSUMED IN RAISING TEMPERATURE OF SOLUTIONS
221°F.
212°F.
Salt solution 25%
Solution Boils at 221°F. instead of 212°F. which is the boiling point of pure water.
Specific heat of solution is 0.8073 instead of 1.0 for water
Thus 1,000 pounds, raised from 60° to the boiling point, require,
1000 x (221 – 60) x 0.8073 = 130,000 B.t.u.
— Against 152,000 B.t.u. for pure water.

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

RECORDING GAS CALORIMETER

THE calorimeter which is shown in the accompanying illustration consists of an air chamber 4, to the top of which a registering device 3 is attached by means of the pipe 7. A plate 8 is fixed to the upper end of the chamber, and a cylindrical shell 10 surrounds it. Below the air chamber 4 there is arranged a flue device 14. This flue device



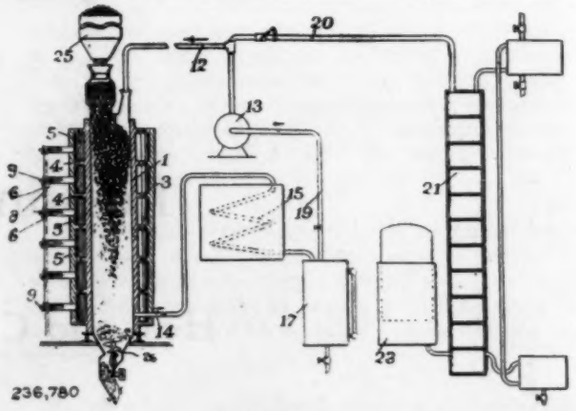
is open at its upper and lower ends. A burner 1 is fixed within the flue device and gas is led to this burner through the pipe 8. The aforementioned cylinder 10 is surrounded on the inside by a lining of non-heat conducting material.

This apparatus is patented in the United States, Patent No. 1,549,529.

TOTAL GASIFICATION OF COAL

IN this process, bituminous coal is completely gasified, leaving a residue only of ash. A vertical retort 1 is spaced from an enclosing space 3 by annular ribs 4. The ribs form a series of annular chambers 5, each of which is provided with gas burners, comprising branch pipes 6 for gas, each having a regulating valve 9, and valve-controlled air pipes 8. The heat applied at different levels may thus be regulated as desired. The coal is fed into the uper end of the retort from a hopper 25, and the upper zone is heated to about 800° C. The distillate is forced downwards through the coal by a blower 13 to the lowest zone where the temperature is 1,600° C. The volatile products are cracked in the lowest zone, forming fixed gas, which is drawn through pipe 14 to the condenser 15, where any condensible vapor is removed.

The condensate is separated from the fixed gas in the tank 17, and the gas passes through the pipe 19 to the blower 13, which delivers the main portion through pipe 20 to scrubber 21 and reservoir 23.



Part of the gas returns through the pipe 12 to the top of the retort, and, together with the water vapor liberated in the upper part, completely gasifies the incandescent coke in the lower part. Water or steam may be added to the gas entering the top of the retort if necessary for combination with the carbon. The process renders it possible to use cannel coal which cannot be used for gas making by the ordinary processes.—British Patent No. 236,780.

FORMATION OF COKE

IN order to test modern theories concerning the progress of coke formation in ovens, samples of coal each contained in a perforated iron box were embedded in the charge of an oven and withdrawn and quenched in sand as desired. From an examination of sections of coke thus produced the following points emerge: Cooking seams (i. e., layers separating coked from uncoked material) do not run parallel to the oven walls, but their direction is dependent upon the temperature variations in the oven walls and the penetration of heat through the charge.

The effect of irregular heat penetration is to produce tension cracks in the coke, which is thereby considerably weakened, so that disintegration more readily takes place on pushing the charge. When unscreened coal is used the direction of the coking seams is very irregular and the coke is unsuitable for metallurgical purposes because of its uneven structure. Large cracks appear on the face of the charge next to the oven walls at a very early period in coking, and it is inferred that the cracks in coke charges are not necessarily the result of contraction of the coke immediately prior to the end of the carbonizing period, but to contraction which takes place during the coal fusion stage.

The coking seam at the bottom of the oven fol-

lows an inclined path due to penetration of heat from the sole as well as from the sides of the oven. Wherever oven soles are specially heated this penetration of heat extends a considerable way up the oven and is responsible for a number of tension cracks in the coke and excessive quantities on breeze on discharge. An explanation of the formation of spongy coke near the top of oven charges is suggested. The top of the charge is carbonized by radiant heat from the crown arch before the vertical coking seams have reached the middle of the charge and the resistance to the exit of tarry vapors through this hot zone is diminished and consequently the tar accumulated in the uncarbonized center portions of the charge suffers decomposition in its attempt to leave by this path of least resistance.—(Fuel, 1925, 4, 169-75.)

Market Remains Steady

Higher price levels forseen--Increasing demand for quality goods

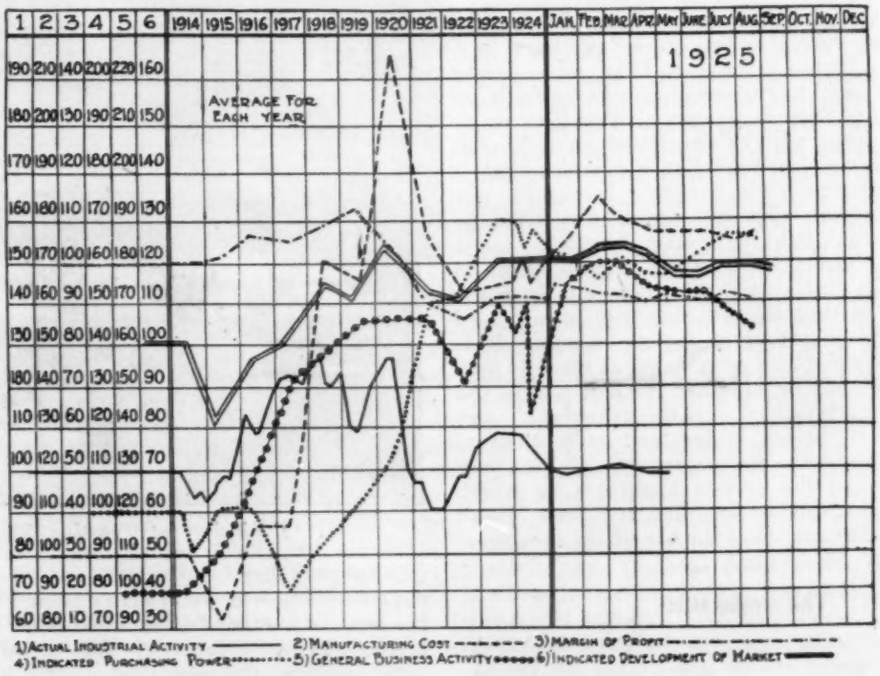
L. W. Alwyn Schmidt

THE past month has brought no material change in the situation. The market is still playing a waiting game and there are no developments indicating a decided change in any direction. A rise of the cost of living has been noted which, if it continues, cannot be without effect upon the purchasing power of the nation. But this rise at the present time is not yet strong enough to bring about a strong downward movement of the purchase reserve. It was absorbed, in part at least, by a slight rise in the wages in some of the key industries. Also the increase in price is not confined to foodstuffs. The cost of industrial production has steadily increased during the last months and may force a general upward movement of price levels with the approach of the autumn season. While such a development would be in the interest of the industrial producer and wage earner, there is, on the other hand, danger that higher prices may result in a renewed abstention of the consumer from the market. If prices, therefore, are set for a rise, industry will have to consider also the advisability of a general improvement in the quality of merchandise.

A Quality Merchandise Market

If there ever was a market favoring the introduction of quality merchandise it is the present. The last summer has been one of industrial experimenta-

(Continued on page 232)


1 2 3 4 5 6
1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV. DEC.
1925
AVERAGE FOR EACH YEAR
1) Actual Industrial Activity
2) Manufacturing Cost
3) Margin of Profit
4) Indicated Purchasing Power
5) General Business Activity
6) Indicated Development of Market

THE FUEL OF THE FUTURE—WHAT SHALL IT BE?

(Continued from page 216)

man. For the latter requires a thorough training in fundamentals that would tax the patience of the average salesman unless he was so fortunate as to have acquired considerable of that knowledge earlier in his career.

The Sales Engineer, the Nucleus

Thus in this system we would have the engineer with selling ability forming the nucleus of the industrial organization. If the industrial gas business of the fuel is to develop along these lines, each gas company will have to have industrial sales engineers, equipped with certain special knowledge of various industrial operations. It is hardly to be expected that one man will know sufficient about all or any industry into which gas can enter as a fuel, and it will therefore be necessary to have men who are specially trained in the various fields. Thus, for example, in the heat treating field it will be necessary to have industrial sales engineers who understand the difficult science of metallography and who have had experience in the heat treatment of metals, a field which is very well suited for gas but which requires most careful handling and consideration of operating details in order that the results expected of this fuel are actually obtained in practical operations. Then again in the chemical field, where heat is also employed and where gaseous fuel can well be used, it will be necessary to have men who have been trained in chemistry and chemical engineering.

Certain Selling Ability Necessary

All these men will also have to be salesmen in a certain sense. They will have to have some selling ability. That such an organization can be built up by gas companies there is no doubt. Just how many can afford to have so well-developed an industrial organization is not known. But it remains that if the industrial business which rightly belongs to gas is to be secured, an efficient organization must be existent in the gas field to develop leads, to supply the necessary thermal data to the manufacturer in whose plant the thermal improvement is to be made and to see to it that the gaseous fuel is not used until all conditions are right for its success. It is a fact that no matter how advantageous the fuel may be, success will not be obtained with it unless the conditions under which it is used are right. Gas men are good engineers, understand well thermal problems, but they are no magicians. Unless they are provided with the proper apparatus in which the fuel is burnt, unless they are cognizant of all the conditions that surround the use of the fuel, good results will not be secured.

The Apparatus

It remains to bring again to the attention of the industrial gas engineer the importance of the apparatus. We have tried to show the importance of the man in the industrial field, but the man cannot obtain good results unless he has a good apparatus in which to burn his fuel. There has been a certain amount of inertia in the gas business which has held back the development of efficient industrial gas appliances, but this is now a thing of the past. Gas men are now thoroughly convinced of the fact that gas cannot be successful in the industrial field unless efficient gas apparatus is available in which to use the fuel. For some purposes it is possible to use a more or less standardized apparatus, but then again there are many special applications of gas as industrial fuel which require special design of apparatus. In fact, the special cases are much more numerous than the general.

Each Application to Be Treated Separately

It therefore remains that each application of industrial gas as fuel must be examined separately. A special apparatus must in most cases be designed, and even if a standard type of apparatus is used, certain changes must be made in it to render it more suitable for the special case at hand. It is also necessary constantly to develop new apparatus for uses to which industrial gas has not yet been put. This requires research and continuous experimentation. The recent establishment of a research testing laboratory is a step in the right direction. The

Typical Heat Treating Room

gas industry has been urged many times to take a page from the electrical man's book. Sometimes he has been importuned to seek example when such example was not called for. But in this case he can well emulate the electrical man's example. The

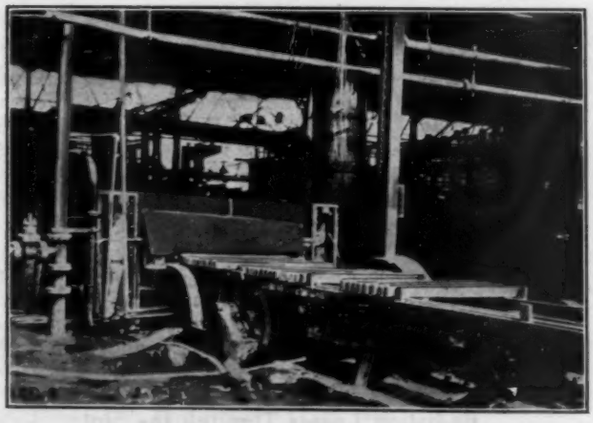
electrical industry has been successful in the industrial fuel field only because it was satisfied to spend considerable time and money in developing peculiarly efficient electrical apparatus which counterbalanced to a certain extent the disadvantages of the high price of electrical fuel. The gas man has an initially much stronger case, for his fuel is not only just as efficient as electricity, when properly used, but also considerably cheaper. If he continues to experiment and develop new equipment for burning gas and for solving thermal problems in industry, the field will be opened to him in all lines of manufacturing and it is hard to see how any other fuel will be able successfully to compete with it in the future for industrial business.

The Importance of Publicity

Hence the two fundamental essentials are the man and the machine. But it is a fact that even when both are developed in a high degree progress is sometimes slow because the general public is not well acquainted with what is going on and with what an industry might be in the position to do for them unless vigorous methods are taken to acquaint it with the facts. This has been the case more or less in the industrial gas business in various parts of the country. The gas man, who is known for his modesty and great reluctance to appear in print, has not been playing up his wares in the proper manner to his public. Electricity has been proclaimed from the figurative housetops as the supreme power medium of all time and people in general have come to believe it, so that at the present day even the school child knows that the electric motor is the premier power producing agent made. Recently electricity has proclaimed itself as well as a superior heating agent. But in this connection it has not nearly so well proven a case as it did in the power field. It is nevertheless trying to educate the people to regard it as an important, if not the most important, heating agent.

This is the field of the gas man and he should take steps to protect it. Gas and not electricity is the premier heat producing medium. The gas man knows it, but the general public does not. And it is up to the gas industry to see to it that its fuel is more popularly known not only as a kitchen fuel but as an industrial fuel as well. The industry must proclaim it loudly and emphatically. It must advertise it to the general public. It must build up the same kind of feeling towards gas in the average man and woman as they now have towards electricity as the power medium. If the gas industry continues the work it has been doing along these lines, it will build up an undercurrent of popularity, a feeling of understanding amongst the average citizens, which cannot help but have a favorable effect on the prospective user of gas as industrial fuel. This is simply taking advantage of the psychological effects of advertising and their effectiveness has been tested over and over again.

It has been deemed proper to introduce this long digression at this point in our story to bring to the attention of the industrial gas man once again some of the important problems that surround his particular field in the gas business. There now remain to be considered two more examples of the heat treatment of metals, whereupon this section of the Fuel of the Future series, that concerns the application of gas to the various processes that are included in the heat treatment of metals, will have been completed.



Continuous Annealing Furnace

Continuous Annealing Furnace

This type of furnace is again an example of what we have emphasized a number of times in these articles, the necessity of combining automatic mechanical effects with the heating effects in the gas fired furnace. The use of mechanical devices, for reducing the time consumed in the heat treating operation as well as decreasing the labor costs, is one of the most important features of the introduction of gas into an industrial establishment. As has been mentioned before, when this is done the saving that can generally be effected in the entire heat treating operation will be such that the added cost of gaseous fuel, in comparison with whatever lower priced fuels may have been used heretofore, will be counterbalanced for the most part and will not therefore play any part in the economics of the process.

In this particular case the continuous annealing furnace was used for annealing steel tubes. These tubes were placed on a suitably designed and constructed conveyor and were then passed through a muffle furnace. The furnace was ten feet long, forty-four inches wide and sixteen inches high to the spring and twenty-two inches to the crown. The muffle was supported on piers and the hearth was eliminated. The walls of the furnace were made from four and one-half inch firebrick and carried a four and one-half inch insulation. A steel casing formed the outside of the furnace. The arch in the furnace was likewise constructed of four and one-half inch fire brick and was also provided with a four and one-half inch insulation. The front steel plates and angles were similar to those used in the construction of the standard forge and the bottom

THE FUEL OF THE FUTURE—WHAT SHALL IT BE?

(Continued from page 216)

man. For the latter requires a thorough training in fundamentals that would tax the patience of the average salesman unless he was so fortunate as to have acquired considerable of that knowledge earlier in his career.

The Sales Engineer, the Nucleus

Thus in this system we would have the engineer with selling ability forming the nucleus of the industrial organization. If the industrial gas business of the fuel is to develop along these lines, each gas company will have to have industrial sales engineers, equipped with certain special knowledge of various industrial operations. It is hardly to be expected that one man will know sufficient about all or any industry into which gas can enter as a fuel, and it will therefore be necessary to have men who are specially trained in the various fields. Thus, for example, in the heat treating field it will be necessary to have industrial sales engineers who understand the difficult science of metallography and who have had experience in the heat treatment of metals, a field which is very well suited for gas but which requires most careful handling and consideration of operating details in order that the results expected of this fuel are actually obtained in practical operations. Then again in the chemical field, where heat is also employed and where gaseous fuel can well be used, it will be necessary to have men who have been trained in chemistry and chemical engineering.

Certain Selling Ability Necessary

All these men will also have to be salesmen in a certain sense. They will have to have some selling ability. That such an organization can be built up by gas companies there is no doubt. Just how many can afford to have so well-developed an industrial organization is not known. But it remains that if the industrial business which rightly belongs to gas is to be secured, an efficient organization must be existent in the gas field to develop leads, to supply the necessary thermal data to the manufacturer in whose plant the thermal improvement is to be made and to see to it that the gaseous fuel is not used until all conditions are right for its success. It is a fact that no matter how advantageous the fuel may be, success will not be obtained with it unless the conditions under which it is used are right. Gas men are good engineers, understand well thermal problems, but they are no magicians. Unless they are provided with the proper apparatus in which the fuel is burnt, unless they are cognizant of all the conditions that surround the use of the fuel, good results will not be secured.

The Apparatus

It remains to bring again to the attention of the industrial gas engineer the importance of the apparatus. We have tried to show the importance of the man in the industrial field, but the man cannot obtain good results unless he has a good apparatus in which to burn his fuel. There has been a certain amount of inertia in the gas business which has held back the development of efficient industrial gas appliances, but this is now a thing of the past. Gas men are now thoroughly convinced of the fact that gas cannot be successful in the industrial field unless efficient gas apparatus is available in which to use the fuel. For some purposes it is possible to use a more or less standardized apparatus, but then again there are many special applications of gas as industrial fuel which require special design of apparatus. In fact, the special cases are much more numerous than the general.

Each Application to Be Treated Separately

It therefore remains that each application of industrial gas as fuel must be examined separately. A special apparatus must in most cases be designed, and even if a standard type of apparatus is used, certain changes must be made in it to render it more suitable for the special case at hand. It is also necessary constantly to develop new apparatus for uses to which industrial gas has not yet been put. This requires research and continuous experimentation. The recent establishment of a research testing laboratory is a step in the right direction. The

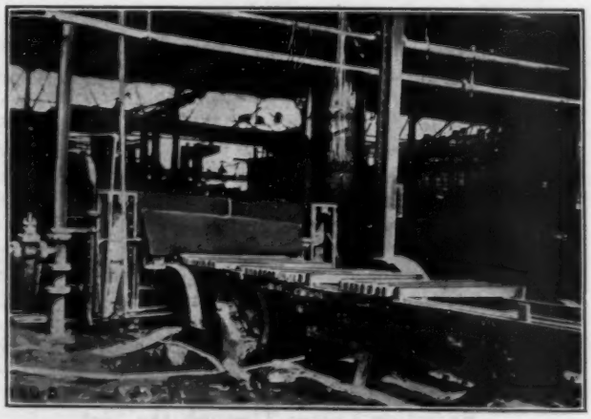
Typical Heat Treating Room

gas industry has been urged many times to take a page from the electrical man's book. Sometimes he has been importuned to seek example when such example was not called for. But in this case he can well emulate the electrical man's example. The

electrical industry has been successful in the industrial fuel field only because it was satisfied to spend considerable time and money in developing peculiarly efficient electrical apparatus which counterbalanced to a certain extent the disadvantages of the high price of electrical fuel. The gas man has an initially much stronger case, for his fuel is not only just as efficient as electricity, when properly used, but also considerably cheaper. If he continues to experiment and develop new equipment for burning gas and for solving thermal problems in industry, the field will be opened to him in all lines of manufacturing and it is hard to see how any other fuel will be able successfully to compete with it in the future for industrial business.

The Importance of Publicity

Hence the two fundamental essentials are the man and the machine. But it is a fact that even when both are developed in a high degree progress is sometimes slow because the general public is not well acquainted with what is going on and with what an industry might be in the position to do for them unless vigorous methods are taken to acquaint it with the facts. This has been the case more or less in the industrial gas business in various parts of the country. The gas man, who is known for his modesty and great reluctance to appear in print, has not been playing up his wares in



Continuous Annealing Furnace

the proper manner to his public. Electricity has been proclaimed from the figurative housetops as the supreme power medium of all time and people in general have come to believe it, so that at the present day even the school child knows that the electric motor is the premier power producing agent made. Recently electricity has proclaimed itself as well as a superior heating agent. But in this connection it has not nearly so well proven a case as it did in the power field. It is nevertheless trying to educate the people to regard it as an important, if not the most important, heating agent.

This is the field of the gas man and he should take steps to protect it. Gas and not electricity is the premier heat producing medium. The gas man knows it, but the general public does not. And it is up to the gas industry to see to it that its fuel is more popularly known not only as a kitchen fuel but as an industrial fuel as well. The industry must proclaim it loudly and emphatically. It must advertise it to the general public. It must build up the same kind of feeling towards gas in the average man and woman as they now have towards electricity as the power medium. If the gas industry continues the work it has been doing along these lines, it will build up an undercurrent of popularity, a feeling of understanding amongst the average citizens, which cannot help but have a favorable effect on the prospective user of gas as industrial fuel. This is simply taking advantage of the psychological effects of advertising and their effectiveness has been tested over and over again.

It has been deemed proper to introduce this long digression at this point in our story to bring to the attention of the industrial gas man once again some of the important problems that surround his particular field in the gas business. There now remain to be considered two more examples of the heat treatment of metals, whereupon this section of the Fuel of the Future series, that concerns the application of gas to the various processes that are included in the heat treatment of metals, will have been completed.

Continuous Annealing Furnace

This type of furnace is again an example of what we have emphasized a number of times in these articles, the necessity of combining automatic mechanical effects with the heating effects in the gas fired furnace. The use of mechanical devices, for reducing the time consumed in the heat treating operation as well as decreasing the labor costs, is one of the most important features of the introduction of gas into an industrial establishment. As has been mentioned before, when this is done the saving that can generally be effected in the entire heat treating operation will be such that the added cost of gaseous fuel, in comparison with whatever lower priced fuels may have been used heretofore, will be counterbalanced for the most part and will not therefore play any part in the economics of the process.

In this particular case the continuous annealing furnace was used for annealing steel tubes. These tubes were placed on a suitably designed and constructed conveyor and were then passed through a muffle furnace. The furnace was ten feet long, forty-four inches wide and sixteen inches high to the spring and twenty-two inches to the crown. The muffle was supported on piers and the hearth was eliminated. The walls of the furnace were made from four and one-half inch firebrick and carried a four and one-half inch insulation. A steel casing formed the outside of the furnace. The arch in the furnace was likewise constructed of four and one-half inch fire brick and was also provided with a four and one-half inch insulation. The front steel plates and angles were similar to those used in the construction of the standard forge and the bottom

steel plate was provided with legs supporting the furnace. The height from the floor to the bottom of the muffle was about thirty inches. There were chain doors at each end of the furnace.

Details of the Calculation

The work that had to be turned out by this continuous muffle furnace was from 50,000 to 70,000 feet of tubing per 24 hours. The size of the tubes varied from a quarter-inch to four inches diameter and from number 14 to number 22 gauge. In order to figure the gas consumption the average was assumed to be the case where 60,000 feet of 1.5 inch tubing, number 16 gauge, with a weight of one pound per cubic foot, were treated in the furnace in a period of 24 hours. This, then, meant 60,000 pounds per 24 hours or 60,000 equal to 2500 feet per hour or

$$\frac{}{24}$$

pounds per hour.

The temperature to which the pipe was heated in the furnace was 1450 degrees C. The number of 1.5 inch tubes in the furnace at one time was seventeen. This is figured on the basis that the distance occupied by each tube in the width of the furnace was 1.75 inches, figured from center to center of the tubing. Thus the width of the furnace 30 divided by 1.75 gives 17 tubes.

Speed of Conveyor

The next step in the calculation is the determination of the speed of the chain conveyor. Speed times the number of tubes in the furnace must be equal to the number of feet of pipe moved per hour or per minute through the furnace. Thus if the speed is x, then 17x must be equal to 60,000 or $17\ x = \frac{41.6}{24 \times 60}$ or x is equal to 2.4 feet per minute. The figure 60 reduces the speed from feet per hour to feet per minute. The speed is figured as 2.5 feet per minute on the average. Then, inasmuch as the furnace is ten feet long, the average length of time that the work is in the furnace is 10 divided by 2.5 or 4 minutes.

It was determined that the weight of the conveyor that is heated in the furnace per hour is five pounds per foot. The calculation of gas consumption must not only be figured for the work in the furnace, but also for the conveyor which is similarly heated up while passing through the muffle.

Thus the rate of travel of the work per hour, that is, of the conveyor which carries the work as well, is 2.5 feet, the rate per hour is 60 x 2.5 or 150 feet. If the weight of the conveyor is five pounds per foot per hour, then 150 multiplied by 5 gives 725 pounds of metal in the conveyor that passes through the muffle in an hour's time.

Area of Furnace

The next step is to determine the internal area of the furnace. This is found as follows:

$10 \times 12 \times 44 = 5280$ square inches
$10 \times 12 \times 44 \times 1.04 = 5500$ square inches
$120 \times 16 \times 2 = 3840$ square inches
$44 \times 18 \times 2 - 36 \times 8 \times 2 = 1010$ square inches

This makes a total of 15630 square inches or, divided by 144, approximately 110 square feet.

If the temperature of the inside of the muffle is to be 1450 degrees F., it is necessary to figure the gas consumption for the maintenance of a temperature of 1800 degrees F. on account of the large amount of work that is passing through the furnace. In order to hold a temperature of 1800 degrees F. with a wall of 4.5 inch firebrick and 4.5 inch insulation, the holding consumption will be approximately 2.5 cu. ft. of gas per hour per square foot of area. This figure is found by reference to the curve sheet showing radiation losses given in a prior article in this series. At a temperature of 1800 degrees F. the curve shows a consumption of 5.5 cubic feet of gas per hour per square foot of area. This pertains to a furnace with walls 4.5 inch thick but without any insulation. It is estimated that the particular furnace under examination will require less than half of this figure or approximately 2.5 cubic feet per hour per square foot. The gas that is employed in this installation had a thermal value of 600 B.t.u. per foot.

Holding Consumption

The total holding consumption of gas is therefore 110 square feet x 2.5 or 275 cubic feet of 600 B.t.u. gas per hour. The area of the door openings is found to be 2.5 square feet. From the same curve diagram, referred to above, it is found that in order to maintain a temperature of 1450 degrees F. it will be necessary to consume 3.5 cubic feet of the 600 B.t.u. gas. This temperature is employed in this part of the calculation for it is the maximum temperature that must be maintained as far as the door space is concerned. Therefore the consumption of gas for this purpose is equal to 2.5 x 3.5 or approximately ten cubic feet of 600 B.t.u. gas.

Radiation Losses Through the Slot

The area of the slot is 1.5 square feet and it now remains to calculate the loss by radiation through this area. The consumption of gas is figured to be 38 cubic feet per hour.

The next step is to determine the gas that is employed in heating up the conveyor from the cold. This takes place continuously, for the conveyor cools off considerably after emerging from the outlet end of the furnace and before it enters it again at the inlet end. The weight of the conveyor is 725 pounds per hour passing through the furnace. The amount of heat required to raise the metal of the conveyor from the cold to the temperature of 1425 degrees F. is found to be 240 B.t.u. (This is also obtained from a curve sheet which is given in a former article of

this series.) Thus the total amount of heat required is equal to 725 x 240. It is now assumed that the temperature of the flue gas must be at least 1900 degrees F and the amount of heat that is available in the gases of combustion obtained by burning a 600 B.t.u. gas is 240 B.t.u. per cubic foot. (This figure as well is obtained from a curve sheet given in a former article of this series.) Thus the number of cubic feet of 600 B.t.u. gas required for this purpose is equal to $\frac{725 \times 240}{320}$ or 544 cubic feet.

Figuring the Total Gas Consumption

Then to hold the furnace at the required temperature when the conveyor is not running there will be required 275 cubic feet of 600 B.t.u. gas plus 10 cubic feet plus 38 cubic feet or a total of 323 cubic feet of 600 B.t.tu. gas. When the conveyor is running there will have to be added the holding consumption of the conveyor, which is 544 B.t.u., which makes a total of 867 cubic feet of 600 B.t.u. gas.

There now remains to be calculated the gas in the work. The weight of the work is 2500, the B.t.u. required to raise its temperature per pound from the cold to the holding temperature is 240, as above, and the available B.t.u. in the gases of combustion is as formerly, 320. Thus the consumption of gas for raising the temperature of the work from the cold to the working temperature is as follows: $\frac{2500 \times 240}{320}$ or 1875 cubic feet of 600 B.t.u. gas per hour. The total number of cubic feet of gas consumed per hour is then equal to 1875 plus 877 or 2742 cubic feet. This, then, means that 3.2 times as much gas is used for the work as for the conveyor and furnace when the former is running.

It was found that when the efficiency was figured on this basis, it was calculated to be 47 per cent, which is considered too high. In this calculation the numerator in the fraction is composed of the weight of conveyor and work or 3225 pounds, while this is multiplied by 240 B.t.u. per pound. The denominator is simply 2742 x 600. It was estimated that the efficiency should be not more than 40 per cent, and on this basis the consumption of gas will be approximately 3200 cubic feet per hour.

Treating Aluminum

The final example is that of an aluminum metal annealing furnace. The dimensions of the furnace were 6 feet wide, 6 feet 8 inches high to the spring and 7 feet 3 inches high to the crown and 15 feet 8 inches long. The total internal area was 530 square feet.

The temperature that must be maintained in the furnace was 900 degrees C. In the case of a 580 B.t.u. per cubic foot gas it was found that 0.75 cubic foot per hour per square foot area was required to hold the temperature or a total of 0.75 x 530, equal to 400 cubic feet of gas per hour. This is equivalent to 357 cubic feet of 650 B.t.u. gas per hour or to 212 cubic feet of 1100 B.t.u. gas per hour. (The calculation is simply one of proportion, thus, $\frac{580}{650} \times 400$ and $\frac{580}{1100} \times 400$.)

It is next necessary to determine the amount of gas consumed to heat up the work. The weight of metal was 50,000 pounds per seven hours. The B.t.u. per pound of metal was 200, the total B.t.u. being 5000 x 200 or 1,000,000 B.t.u. With a flue gas temperature of 1100 degrees F., the B.t.u. available in 600 B.t.u. gas is 450 B.t.u. per cubic foot. (See curve sheet in former article of series.) Hence $\frac{1000000}{450}$ is equal to 2220 cubic feet of gas in seven hours, or 317 cu. ft. of 600 B.t.u. gas per hour of 173 cubic feet of 1100 B.t.u. gas per hour. The total consumption of 1100 B.t.u. gas is therefore 212 plus 173 or 385 cubic feet.

METER READING AND BILL DELIVERING

(Continued from page 220)

the practice is limited as far as the Pacific Coast is concerned. One electric company on the Coast adopted this system about a year ago and their deductions have been during this time that the method has worked out very satisfactorily, and they would not change back to the former method. Of course, local conditions would undoubtedly prove to be a very deciding factor in the planning of any such system. For example, if a city has a moving or transient population it can be seen that it would be necessary to have ample protection in the way of deposits, as otherwise there would be a considerable increase in losses, and additional work placed on credit and collection departments. It should be remembered, of course, that there would be considerable saving made in salaries, supplies and miscellaneous expenses which would be offset, to some degree, by slight increases in collection expenses, bad debt losses and, lastly, the loss of revenue which would result in the first month's operation of such system. To offset this last item, some companies which have adopted the system have "set up" an estimated amount as revenue on the general ledgers.

The majority of the members of this committee do not, at present, favor the bi-monthly billing system. However, it is possible that in the future conditions will be such that this system may become universal.

Estimated Bills

It is the opinion of this committee that where readings cannot be secured it is good policy to render estimated bills. This rule, of course, should apply only to domestic accounts which do not average over $10 per month. There are many advantages derived from the adoption of such system, the following of which are a few:

1. The majority of customers would receive bills each month and, as a result, inquiries from customers as to non-receipt of bills would be eliminated.
2. This would also reduce high bill complaints resulting from two or more months' consumption.
3. By having all metered gas debited and billed (same month) the gas revenues would show an increase the first month the method is adopted and also all gas would actually be entered on the company's books as revenue, whereas at the present time such consumption is known as unaccounted-for gas.
4. The earnings could also be controlled to a finer degree. For example, one company's records showed that the number of unread meters increased during the spring and summer months and came to a peak in August, which, undoubtedly, was due to customers being away on vacations.
5. By the adoption of the above system such emergencies as high water periods, floods, or unusual weather conditions, bills could be rendered in the regular manner.

Public Relations

Unquestionably the contact made with the public by meter readers, bill deliverers and collectors is of great importance from the standpoint of public relations and good-will. It should be realized by the utilities that many customers know the company solely through the contact with these men and therefore they are in a position to favorably or unfavorably affect the company's standing with its customers.

Courtesy is a big factor in this connection and we all know that it is very difficult to instill into men who have acquired a careless or indifferent manner an attitude of politeness and deference. While most men are naturally kind-hearted and generous, yet very few are inherently courteous, and the responsibility rests with the company to see that they are properly schooled and trained.

When employees visit customers' premises they should conduct themselves the same as if the case were reversed. They should be imbued with the idea that the effect of a smile and a pleasant "Good morning" cannot be over-estimated.

MARKET REMAINS STEADY

(Continued from page 227)

tion. The producer anxious to get the consumer in the market has offered many inducements. Low prices, change of styles, a large supply of goods, have followed each other in rapid succession, and there has no doubt been some success to some or all of these devices. But the American consumer has undergone a change of heart. He has become more frugal in his desires. So industry will have to study the problem how to produce a quality article at a reasonable price. The production of quality merchandise offers not only many short cuts to economical production but the profits on the sale of such merchandise are more attractive.

The temptation of using labor-saving machinery to turn out cheap machine-made goods may, of course, be very great. But it is one of the claims of the American industrial equipment maker that his equipment is not a mere substitute for manual labor but rather an implement destined to enable the American worker to produce the best kind of merchandise under conditions and in quantities permitting the maintenance of high American living standards without the necessity of sweated labor. It is in fact the American machine tool which systematically eats into the body of low paid labor replacing it by skilled operators of the highest type.

Importance of Development

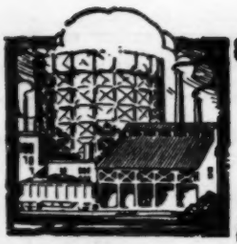
This newer development in the American industry, may we call it the return of quality production, in consequence is of peculiar significance to certain branches of the American industry. The public utilities, especially those supplying energy like the gas industry and electrical industry, should feel its effects. The machine tool industry and fine mechanic industries will similarly soon experience a revival in the demand for their products.

But, looking ahead to the unavoidable consequences of this situation, it is necessary to point out the possibility of a permanent strengthening in the price situation. There is in this ever-recurring turning of the price screw unrest caused by the continued fight for equalization of the cost of industrial products and food. The industrial and agricultural producer of every nation has to meet a large charge for national overhead. This overhead is not only caused by the actual expenditure of government but also by national inefficiency and leaks in the handling of the nation's expenditure. Strikes, slow freight movement, unproductive national expense, are bound to cause an enormous charge upon the cost of industrial production.

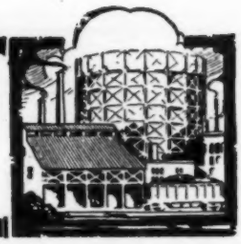
The National Overhead

The national overhead in turn plays upon industry and food production, it causes flurries in the price of many commodities and irritates both consumer and producer. As there is no real remedy for this situation industry and agriculture are trying to guard themselves against their occurrence by allowing themselves a profit margin which, while merely guesswork, exceeds the actual requirements and consequently causes protective measures on the part of the consumer. This testing of the situation with changing prices, sudden rises and declines, has continued all through the summer. It is one of the reasons why business has not settled down to a steady course.

At some period during the fall a stabilization, no doubt, will be established, and we can then expect an uninterrupted flow of good business. It is too early to set even an approximate date for this event, but it should be a fact shortly after the completion of the harvest when once the real grain movement has started.



NEWS OF THE GAS INDUSTRY



A. G. A. Industrial Gas Course to Start in September

Lectures to Be Delivered in Consolidated Gas Company Building

The Committee on Education of Industrial Gas Salesmen of the Industrial Section, A. G. A., has prepared a course for industrial gas salesmen which will be delivered in the auditorium of the Consolidated Gas Co. Building, 130 E. 15th St., New York City, from Sept. 21, 1925, to Oct. 3, 1925.

This course is free to those who attend. Prominent gas men will deliver the lectures. The program of the course follows:

FIRST WEEK

Monday, Sept. 21—10 a. m.: Registration. 11 a. m.: Welcome. Col. Oscar H. Fogg, vice-president, Consolidated Gas Co. of New York, N. Y. Introduction to Course, Henry O. Loebell, vice-president, Combustion Utilities Corp., New York, N. Y. 1:30-3 p. m.: Industrial Heating Requirements, F. W. Manker, vice-president, The Surface Combustion Co., of New York, N. Y. 3-4:30 p. m.: Piping Design and Layout, F. A. Lydecker, assistant general superintendent of distribution, Public Service Electric & Gas Co., Newark, N. J.

Tuesday, Sept. 22—9-12 a. m.: Technology of Furnaces, H. L. Read, ceramic engineer, The Surface Combustion Co., of New York, N. Y. 1:30-4:30 p. m.: Demonstrations in Laboratory of Operation of Furnaces, N. T. Sellman, engineer of utilization, Consolidated Gas Co. of New York, New York, N. Y., and E. W. Weaver, test engineer, The Surface Combustion Co., New York, N. Y.

Wednesday, Sept. 23—9-12 a. m.: Burner Design and Combustion Systems, N. T. Sellman, engineer of utilization, Consolidated Gas Co. of New York, New York, N. Y. 1:30-4-30 p. m.: Demonstrations in Laboratory—Trouble Hunting, Flue Gas Analysis, etc., N. T. Sellman, engineer of Utilization, Consolidated Gas Co. of New York, New York, N. Y., and E. W. Weaver, test engineer, The Surface Combustion Co., New York, N. Y.

Thursday, Sept. 24—9 a. m.-4:30 p. m.: Fuels and Furnace Calculations, H. L. Read, ceramic engineer, The Surface Combustion Co., New York, N. Y.

Friday, Sept. 25—9-12 a. m.: Symposium on Temperature Control, J. D. Andrews, district manager, Brown Instrument Co., Philadelphia, Pa.; W. D. Crouch, sales manager, Industrial Dept., Robertshaw Thermostat Co., Youngwood, Pa.; E. B. Estabrook, district manager, Pyrometer Div'n, Leeds & Northrup Co., Philadelphia, Pa.; S. C. Horn, sales manager, Wilson-Maeulen Co., Inc., New York, N. Y., and R. W. Newcomb, secretary, Charles Engelhard, Inc., New York, N. Y. 1:30-3 p. m.: Symposium on Refractories and Insulation, P. R. Deschere, sales engineer, Celite Products Co., Los Angeles, Calif.; K. M. Karcher, New York agent, General Refractories Co., New York, N. Y., and F. E. Leiby, Refractories Div'n, Norton Co., Worcester, Mass. 3-4:30 p. m.: Symposium on Blowers and Compressors, B. E. Davidson, sales representative, Sullivan Machinery Co., Chicago, Ill.; A. E. Lloyd, assistant manager, The P. H. & F. M. Roots Co., Connersville, Ind., and E. J. Skillman, president, Spencer Turbine Cleaner Co. of New York, New York, N. Y.

Saturday, Sept. 26—9-12 a. m.: Gas in Relation to Competitive Fuels, H. O. Loebell, vice-president, Combustion Utilities Corp., New York, N. Y.

SECOND WEEK

Monday, Sept. 28—9-12 a. m.: Low Temperature Oven Application, M. B. Webber, industrial engineer, Athol Gas & Electric Co., Boston, Mass. 1-5 p. m.: Inspection trip, including visits to American Machine & Foundry Co., Cameron Machine Co., Robins Dry Dock & Repair Co., Chas. Fischer Spring Co., and Mergenthaler Linotype Co.

Tuesday, Sept. 29—9-12 a. m.: Heat Treatment of Steel, P. C. Osterman, vice-president, American Gas Furnace Co., Elizabeth, N. J. 1-5 p. m.: Inspection trip, including visits to National Biscuit Co., New York, N. Y.; Loose-Wiles Co., Long Island City, N. Y.; Standard Oil Co., Long Island City, N. Y.; James Butler, Inc., Long Island City, N. Y., and National Carbon Co., Long Island City, N. Y.

Wednesday, Sept. 30—9-10:30 a. m.—Solution Heating, P. Dorchester, New Jersey sales representative, The Surface Combustion Co., New York, N. Y. 10:30-12 a. m.: Gas-Fired Steam Boilers, A. V. Leudemann, New York representative, Mears-Kane-Ofeldt, Inc., Philadelphia, Pa. 1:30-4:30 p. m.: Non-Ferrous metals, R. S. Wile, vice-president, Fabulosa Mines, Ltd., La Paz, Bolivia.

Thursday, Oct. 1—9 a. m.-4:30 p. m.: Gas Applications Not Previously Covered, C. B. Phillips, vice-president, The Surface Combustion Co., New York, N. Y.

Friday, Oct. 2—9-12 a. m.: Plant Surveys, H. M. Henry, director Research Institute, Combustion Utilities Corp., New York, N. Y. 1:30-3 p. m., Essentials of Advertising, V. E. Pratt, president, Pratt & Lindsey Co., Inc., New York, N. Y. 3-4:30 p. m., Salesmanship, H. L. Whitelaw, vice-president, The A. H. Wolff Gas Radiator Co., New York, N. Y.

Saturday, Oct. 3—9-12 a. m.: Resumé—Problems and Questions Submitted by Students, J. P. Leinroth, general industrial field fuel representative, Public Service Electric & Gas Co., New York, N. Y.

Southern Gas Company Is Expanding Rapidly

Greensboro, N. C.—The Southern Gas & Power Company, with eight large plants in as many cities, has acquired a gas plant in Valdosta, Ga., and another in Gadsden, Ala., the two involving a total of half a million dollars. The concern here is also known to be negotiating for three plants in Pennsylvania and intends to build another in that state, which would make the properties of the concern total about $10,000,000.

Important Gas Research at Johns Hopkins

Within the past year considerable attention has been directed towards the origin of carbon disulphide. This for the reason that the impurity of gas containing this material is decidedly a corrosive agent and a disturbing factor in the average gas main system. Numerous attempts have been made to remove the material in the purification process, all of which naturally entails a certain amount of equipment and labor for operation with the consequent expenses.

Dr. Wilbert J. Huff, professor in gas engineering at Johns Hopkins University, has been studying various effects of this medium of corrosion and has, after consistent labor, found it possible to carbonize coal, even with high sulphur content, in such manner that carbon disulphide can be produced, or not, at will.

This study has disproved the generally accepted theory that carbon disulphide is produced by the interaction of hydrogen sulphide and red hot coke. Moreover, it explains the variation in the production of carbon disulphide noted by Hutton and Thomas, whose work has already come to the notice of the industry, and throws a new light on other researches on the behavior of the coal sulphur in coking.

In connection with this research it was necessary to devise new chemical methods for the determination of carbon disulphide in small volumes. A preliminary report of these methods was presented to the Gas and Fuel Section of the American Chemical Society during its national meeting at Johns Hopkins last April.

A full and detailed report on the entire research made in this connection will be submitted and read by Dr. Huff at the next convention of the American Gas Association in Atlantic City, October 12th to 16th.

Open House Week in Michigan

Ann Arbor, Mich.—The week of October 5 has been set for the second annual public utility open house week, to be observed by the state's gas and electric companies, according to an announcement by the public utility information bureau here today. These utilities are planning to invite their customers and the public in general to visit their plants and offices during the week. Guides will be chosen from employes who are thoroughly familiar with the various processes and machinery used.

Students of civics, physics and chemistry in the high schools will be shown the various applications of principles studied in the classroom. Classes will be invited to attend in a body, as hundreds did last fall.

Among the interesting features of the week at the gas plants will be the demonstration of how modern science reclaims what would otherwise be coal smoke, in the form of tar, ammonia and naphthalene, and leaves two clean-burning fuels—gas and coke. Those who visit the power plants will be shown how a few large stations, by wholesale generating of electricity, can serve whole regions efficiently and reliably with power and light, through use of high-voltage super-power lines.

Tours of the plants will be scheduled at frequent intervals each day of the week.

That the invitation may reach every resident of the cities in which open house will be held, the utilities plan to advertise in the local newspapers the details of the program and the arrangements for the tours.

Plans also include talks to be given before business men's luncheon clubs and women's clubs on the progress made by utilities in rendering efficient and continuous service.

Gas Co. Changes Capitalization

Albany, N. Y.—The Halfmoon Light, Heat & Power Company, Mechanicville, has filed a certificate in the office of the Secretary of State changing the par value of its capital stock from 12,000 shares $25 par value to 12,000 shares non par value.

Birmingham Gets Special House Heating Rate

Birmingham, Ala.—Installation of a new service for those desiring to heat their homes by gas is announced by the Birmingham Electric Company following approval by the Alabama Public Service Commission of the company's petition for a "seasonal rate" basis for dispensing "space heating" or house heating gas.

Explaining the rate recently, J. S. Pevear, general manager, said the seasonal rate would be a charge of 30 cents for each cubic foot of hourly demand. Thus, if a furnace uses 200 cubic feet an hour, the consumer pays 30 cents per cubic foot, or $60 as the seasonal rate in addition to the regular charge for the gas.

This rate is necessary, according to Mr. Pevear, because gas for heating purposes would be used only about three months a year, leaving the company's investment necessary to provide the service, idle for nine months.

The new rate became effective midnight August 4, but it is applicable only between November 1 and April 30 of each year.

It has no effect whatever on regular users of gas for cooking or lighting.

Public Service Officials Show Their Appreciation

Each year the Denver "Post," Colorado's largest newspaper, holds a semi-professional baseball contest, the competing teams composed of players living in the Rocky Mountain regions. From these teams some of the players are drawn into organized baseball. Merit decides that part of it. There are various prizes given the winners. As soon as the arrangements were made for this year's tournament the Public Service Company announced that it would donate a fifty-dollar silver trophy to the

leading pitcher, and then J. W. Fowler and F. R. Jamison, officials of the company, purchased a box, good for the entire series.

Noble L. Clay Resigns from Winston-Salem Gas Co.

Noble L. Clay, for the past six years general manager of the Winston-Salem Gas Company, has resigned his position to go to Palm Beach, Fla., where he will be associated in the future with Skinner Machinery Company. Mr. Clay will have charge of the home equipment department of the company, serving Palm Beach and a territory about 35 miles in each direction from that city.

Mr. Clay will handle the service of the department in the placing of refrigerators, oil burners, gas and electric ranges, gas making machines, individual light plants and miscellaneous home equipment.

With the resignation of Mr. Clay from the local company several interesting announcements as to the future conduct of the business are made. T. R. Warren, with the local company for some time, will assume the duties of local manager of the company, with the general manager, K. K. Garrett, stationed in Greensboro. The headquarters of the company will, in the future, be located in Greensboro, with Mr. Garrett in charge.

When Mr. Clay went with the local company about six years ago the company had about 30 miles of mains. Today there are approximately 60 miles of mains in the city and the service of the company now takes in practically every real estate development. The consumers of the company have been increased in the past six years from 1,500 to 2,500 and the company has doubled its gas sales.

Along with the growth of the company it is interesting to note that under the leadership of Mr. Clay, the local company led the entire United States for two years, 1923-24, in the sale of gas appliances, being figured on a pro-rata basis.

Mr. Clay is well known throughout this city and section and his many friends will regret to see him leave the city but wish him much success in his new location. Mr. Clay is a member of the Rotary Club and a number of local fraternal orders. Mrs. Clay will accompany him to Florida.

$100,000,000 Plant for Gas Co.

A building contract calling for an expenditure of $100,000,000 has been awarded by the Consolidated Gas Company for the erection of a gigantic plant on a tract of 180 acres in the East Bronx, according to the Ward Building Reports. The work is to be done by the William F. Kenny Company from plans prepared privately.

The tract has extensive frontages along Hunt's Point Road and Edgewater Avenue, and extends for a considerable distance along the Bronx River. Grading work has already been started. The Bartlett-Hayward Company, of Baltimore, will act as consulting engineers.

Lowellville Gets New Gas Franchise

Lowellville,—A new gas franchise, to be in force for two years, has been adopted by the Village Council and approved by Mayor John Zuercher.

The rates provided by the new franchise are the same as in the present contract, with an increase of 10 cents in the service charge.

The service charge will be $1.35 per month, and the rate per thousand feet will thereafter be 65 cents.

The ordinance was passed as an emergency measure and took effect September 6.

Basford Trophy Awarded to Technical Section of Pacific Coast Gas Association

The Awards Committee voted the Basford Perpetual Trophy to the Technical Section. The number and value of the papers submitted by this section was the deciding factor. The Accounting Section was a close competitor, due to the excellent manner in which its meetings were conducted and the valuable discussions engaged in.

The following committees received gold medals:

Home Service Bureau—C. R. Miller, chairman; F. H. Bivens, R. M. Conner, E. W. Kimmell and W. H. Mixter.

Employees' Relations with the Public—W. H. Barton, chairman; J. G. Bourus, F. C. Ingram, John Keillor, C. E. Lasher, E. G. McCann, O. L. Moore, W. T. Neill and J. L. Stone.

Naphthalene Removal — J. E. Spelce, chairman; H. M. Barnes, J. T. Leary, W. G. Mulford and C. Thorpe.

West Boston Gas Company to Issue $273,000 Stock

Boston, Mass.—The West Boston Gas Company has filed a petition with the Department of Public Utilities for authority to issue additional capital stock to the value of $273,300, in 10,952 shares for cash at a par value of $25. The new issue will be for the purpose of payment for extension to plant already made and for the payment of bonds maturing April 1, 1926.

The company's capital stock is limited to $426,000, all of which is outstanding.

Gas Rates Approved

Albany. N. Y.—The Public Service Commission has approved a new schedule of the Potter Gas Company for natural gas supplied in the towns of Caton and Corning, in Steuben County, and the town of Southport, Chemung County, effective August 24, 1925, providing rates as follows for service for light and heat: In the towns of Caton and Corning, 93c (increase of 12c) per M cubic feet. In the town of Southport, $1 (increase of 19c) per M cubic feet. No change in minimum monthly charge ($1.10). No change in discount for prompt payment of 10c per M cubic feet; 10c on minimum bill.

Peoples Gas to Observe 75 Years of Active Service

The Peoples Gas Light and Coke Company is observing its 75th year of service in Chicago. The first gas company, the Chicago Gas Light and Coke Company, was chartered by a special act of the legislature passed on February 12, 1849. A second one, The Peoples Gas Light and Coke Company, was chartered six years later, and thirteen companies that came after, operated under the same charter.

The first authorization of gas main laying in Chicago called for 24,000 feet of pipe or about four and one-half miles. There are now 3,400 miles of gas mains in the city. The first gas plant was located at Lake and Market streets and had one gas "tank" or holder with a capacity of 60,000 cubic feet of gas. There are now holders of 10,000,000 cubic feet capacity and one of 15,000,000 cubic feet capacity is under construction.

In 1850, Chicago's population was about 30,000 and the total consumption of gas during the first year of gas service was about 8,000,000 cubic feet. This year, with a population of 3,000,000, Chicago will use more than 32,000,000 cubic feet of gas. Thus the city's population has increased only 100 times while the consumption of gas has been multiplied 1,000 times.

New Gas Main Soon Under the Hudson

A gas engineering feat involving unusual difficulties is being undertaken in the laying of a gas main under the Hudson River from Beacon to Newburgh, at which point the Hudson is about a mile and a quarter wide.

Men and materials are being gathered at Beacon, from which town the work will be started.

The new gas main will connect the gas tanks at Beacon with those at Newburgh, thus making possible an exchange of service between the two towns in cases of emergency or abnormal demand at either end, and will insure an uninterrupted supply of gas at all times.

The work of laying the main from the Beacon tanks to the river edge has already been begun. From the bank the pipe will be led straight across the bottom to the Newburgh shore, each section being securely anchored as it is put in place.

Chambersburg Gas Co. Sold to Baltimore Syndicate

Chambersburg, Pa. — The Chambersburg Gas Company has disposed of its property rights and franchises to a Baltimore syndicate and the new corporation will take over the plant early in September or as soon as the stockholders approve the sale. The purchaser is Mr. C. P. Holzderber, of Baltimore, who represents a syndicate that is buying up gas plants in various places in this section of Pennsylvania and Maryland. The price paid was $381,614, or at the rate of $90 per share. The par value is $50.

For some time several syndicates have been after the Chambersburg plant and finally the board of directors of the local organization decided to accept the Baltimore proposition, which was the highest bid made. Its approval will depend upon the sanction of the stockholders, but it is understood a majority have already agreed to the sale, which will be sufficient to close up the deal. All the stockholders have been notified and it remains only for them to approve the transaction, which all will probably do. The new corporation will take over the plant as soon as the deal is finally consummated.

Contracts Awarded

The Muskegon Traction & Lighting Co. have placed contract with the Gas Machinery Co., Cleveland, Ohio, for a new ten-foot water gas set, to be located in the old retort house, and in line with the present two sets.

The old retort house will be rebuilt to suit the new water gas equipment, and the new set will be complete with overhead brick operating floor, oil pumps, air and steam meters, explosion check valve, automatic control, and provision for future waste heat boiler.

The contract includes exhaust steam accumulator with piping valves and regulating equipment to complete the installation.

Among the more recent contracts taken by the U. G. I. Contracting Company, Philadelphia, is that awarded them by Lazote, Incorporated, covering the furnishing and installation at Charleston, West Virginia, of four (4) 11 ft. 0 in. Cone Top U. G. I. Blue Gas Sets, complete with Chrisman Cycle U. G. I. Automatic Controls and Manifolds for the use of exhaust steam in the apparatus. The contract also calls for furnishing and installing U. G. I. Waste Heat Boiler, a blowing plant consisting of three (3) turbine and motor driven blower units and various other auxiliary equipment required for the complete plant.

This plant will be unique inasmuch as it will be perhaps the first blue gas plant that has been equipped with the Pier Process for operation with bituminous coal.

The Bristol, Conn., and Planville Electric Company has recently awarded contract to the U. G. I. Contracting Company in connection with remodeling two (2) 6 ft. 0 in. sets of carburetted water gas apparatus which had been installed by the U. G. I. some years ago, and before many of the present U. G. I. improvements had been devised. Upon completion of the remodeling the demands upon the Bristol plant will be amply taken care of.

In addition to furnishing new generator, the apparatus will be equipped with full hydraulic operation together with U. G. I. master valve and other parts to bring the apparatus up to date.

F. E. Newberry Appointed Manager Jersey Central Power & Light Co.

Mr. F. E. Newberry has been appointed manager of the Jersey Central Power & Light Company and will be located at Belmar, N. J., and will have charge of the gas and electric properties south of Belmar.

Mr. Newberry started his experience in the gas industry with the Peoples Gas Light & Coke Co. of Chicago. He later became manager of the Citizens Gas Company of Kankakee, Ill. He was also manager at Dixon, Ill., for the Wisconsin Security Co. and also at Green Bay, Wis.

Mr. Newberry is a charter member of the Illinois Gas Association and was its secretary and treasurer during 1910 and 1911. Mr. Newberry will work directly under Mr. R. J. Ritchie, vice-president and general manager of the Jersey Central Power & Light Company, located at Long Branch, N. J.